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The Westwide Forest Inventory Data Base: User's Manual

Sharon W. Woudenberg
Thomas O. Farrenkopf

The Authors

Sharon W. Woudenberg, Supervisory Forester, received a B.S. and M.S. in forestry from Colorado State University. She joined the Forest Service in 1980 and has been working with the Intermountain Station's Forest Inventory and Analysis unit since 1984.

Thomas O. Farrenkopf, Supervisory Forester, has worked in all phases of forest inventory and analysis since 1956 at both the Intermountain and Pacific Northwest Research Stations.

Research Summary

A Westwide forest inventory data base was developed to provide data in a format similar to an existing Eastwide data base (Hansen and others 1992). This report describes a standard format in which data can be obtained at a reasonable cost by anyone. This standard format was developed to provide users with as much data as possible in a manner consistent among States in the Western United States.

Preface

The responsibility of the U.S. Department of Agriculture, Forest Service, to collect data, analyze, and report on the forest resources of the Nation is defined in the Forest and Rangeland Renewable Resources Research Act of 1978, P.L. 95-307. This effort is deep rooted, continuing the mandates by Congress in the Forest and Rangeland Renewable Resources Planning Act of 1974 and the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically determine the extent, condition, volume, growth, and depletions of timber on the Nation's forest land. This kind of up-to-date information is essential to realistic forest policies and programs. Forest Service regional research stations are responsible for conducting these inventories and publishing summary reports for individual States.

Forest inventories for the Western United States are conducted by the Pacific Northwest Research Station and the Intermountain Research Station.

For those interested in further analysis, the Forest Service can also provide a portion of the data collected in each inventory. This report describes a standard format in which data can be obtained at a reasonable cost by anyone. This standard format, referred to as the Westwide Data Base (WWDB) structure, was developed to provide users with as much data as possible in a manner consistent among States. Westwide Data Base files can be obtained for any post-1994 State inventory, soon after the inventory compilation is completed. Files for many State inventories conducted before 1994 are also available; however, some data fields may be empty or the items may not have been collected or computed as described in this report. These inconsistencies will be described for each State in an addendum to this document.

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CHAPTER 1—THE WESTWIDE DATA BASE

Periodic forest inventories are conducted for every State in the United States. In the West, these inventories are usually conducted every 10 or more years. Inventory findings are published in a series of statistical and analytical reports produced by U.S. Department of Agriculture, Forest Service, regional Research Stations (fig. 1). However, many forest inventory data users require unpublished information that can be produced from the data collected in the State inventories. Special information needs include:

1. Standard tables for geographic areas other than those published
2. Resource data that are consistent for all States
3. Projections of timber resources based on various assumptions and models
4. Information about specific conditions and species needed for detailed analyses.

In the past, special data requests have been handled differently by the two Western Forest Inventory and Analysis (FIA) programs, depending on the type of request and each program's data processing capabilities.

To accommodate these differences and to make data more compatible among States, a set of core tables was developed (appendix A). The core tables, published in every Western FIA State report, present basic forest resource information in a format consistent from one State to another. The introduction of the core tables made it easier to compare the forest resources of areas in different States and to assess the total resource of an area that crosses State or region boundaries.

A more recent effort to provide consistent data throughout the West is the creation of the Westwide Data Base (WWDB) for FIA and National Forest System plot data. In the West, the National Forest System is responsible for obtaining data on lands it administers. The procedures are similar to those used by FIA, but some differences do occur. For users of the WWDB, however, these differences should be transparent because data have been standardized to conform to the data definitions described in chapter 3. To obtain further information, users are encouraged to contact the appropriate National Forest System Regional office or FIA program. The WWDB relational data tables are produced for a State or substate as soon as the corresponding statistical report is completed. The WWDB contains the data needed to satisfy RPA Assessment needs, produce the core tables, and run the Aggregate Timberland Assessment System (ATLAS) (Mills and Kincaid 1992). Items not available from both programs are not part of the WWDB. An outside user can easily obtain a copy of these data

Pacific Northwest Research Station
P.O. Box 3890
Portland, OR 97208
(503) 326-5640

Intermountain Research Station
324 25th Street
Ogden, UT 84401
(801) 625-5412

Figure 1—Western Forest Inventory and Analysis regions and project headquarters.

base files at a reasonable cost (in 1994, about $250 per State) for their own analysis.

A similar Eastwide data base already exists (Hansen and others 1992). Efforts were made to keep the two data bases similar, but some changes were made. Usually where data item names differ between the two data bases, the data definitions are different. For example, in the Eastwide data base, there is a data item named DBHCUR; in the Westwide data base the similar data item is DIACUR. The difference is that only tree measurements taken at breast height (4.5 feet) are stored in the DBHCUR data item, but the diameter measurement stored in DIACUR may have been taken at breast height or root collar. Caution should be used when aggregating data from both data bases.

Chapter 2 of this publication describes the FIA sampling and estimation procedures, and Chapter 3 presents the WWDB structure in detail. Chapter 4 explains how to use the files to compute basic estimates of area, volume, biomass, number of trees, growth, and mortality. The last chapter tells how to obtain copies of the WWDB for a State.

CHAPTER 2—WESTERN FOREST INVENTORY AND ANALYSIS SAMPLING AND ESTIMATION PROCEDURES

Users of the Westwide Data Base need a basic understanding of FIA sampling and estimation procedures to understand the types of data available. Here, a general discussion of these procedures is presented. Specific sampling methods differ among regions and even among States within a region. If more information about sampling procedures for a specific State is needed, contact the FIA program responsible for that State's inventory (fig. 1).

How Sampling Is Done

Each State inventory begins with the interpretation of remotely sensed samples, such as aerial photos or Landsat digital imagery, that classifies the land by various photo classes. These data are referred to as the primary sample. The total area of a sample usually comes from outside sources (usually Bureau of the Census reports). The primary sample classes are based on land use (such as pasture, cropland, urban). For forested land, more detailed classes are sometimes defined based on criteria such as forest type, volume per acre, stand size, stand density, ownership, and stand age.

Ground plots, known as secondary samples, are measured to gather information that cannot be obtained from the remotely sensed data. The secondary samples are also used to adjust the primary sample for changes since the date of photography, and to correct photointerpreter misclassifications. The photo classification of these ground plots, together with the area estimates from the primary sample, are used to assign area expansion factors to all ground plots. These area expansion factors are used to expand values observed on the plot from a per acre basis to a population basis. An area expansion factor is basically the area (in acres) that the plot represents for estimation purposes. The sampling area, or level at which expansion factors are assigned, is different from State to State, as is the scheme used to assign primary sample classes. For the details of how these expansion factors were assigned to the ground plots for a particular State, contact the appropriate FIA program.

Secondary sample plots are designed to cover a 1-acre or larger sample area. Various arrangements of fixed radius and variable radius (prism) sample points are used to select sample trees to be measured. Ground plots may be new plots that have never been measured, or remeasurement plots that were measured in the previous inventory. For all forested plots, several observations are recorded for each sample tree, including diameter, species, and other measurements that allow the prediction of the tree's volume, growth rate, and quality. These tree measurements form the basis of the data in the tree table.

Forest land is separated into two categories, timberland or woodland, depending on the tree species that stock the sample plot. Timberland is forest land where the sum of stocking values of timber species is at least 10. Woodland is forest land where the sum of stocking values of all trees is at least 10, but the stocking value for timber species is less than 10. Intermountain (INT) FIA defines pinyon, juniper, oak, mesquite, acacia, willow, ironwood, locust, mountain-mahogany, yew, Rocky Mountain maple, and bigtooth maple as woodland species; all others are considered timber species.

Some of the data items in the WWDB come directly from field measurements; others are computed from tree measurements or stand attributes. Net cubic-foot volume is a computed item. Each FIA program uses some type of volume equation to compute this volume based on diameter and other tree and stand attributes. Although equations differ from State to State, they were all designed to compute the same volume.

One important computed item is the tree expansion factor, trees per acre (TPA). This item expresses the number of trees per acre that each sampled tree represents in the current inventory. It is the inverse of the size of the plot the tree was sampled on. For example, if the plot design samples trees under 5.0 inches diameter at breast height (d.b.h.) on a single $\frac{1}{300}$-acre fixed radius plot, this item would have the value 300 trees per acre for a tree less than 5.0 inches d.b.h. If trees 5.0 inches d.b.h. and larger are sampled with five 40 basal area factor (English) angle gauge points, as is common with FIA plots, the expansion factor would depend on the d.b.h. of the tree. Under such a sample, a 14.0-inch tree would have an expansion factor of 7.48 trees per acre, again the inverse of the plot size for a given tree[1].

Another computed expansion factor in the data base is the mortality factor (MTPA). The mortality factor expresses an estimate of how many trees per acre of annual mortality are represented by a given sample tree. This factor is the number of trees per acre of annual mortality that the sample tree represents. In sample designs that have remeasurement plots, this value is zero for a tree that did not die over the remeasurement period. For trees that did die, MTPA is a function of the tree expansion factor and the remeasurement period. Some State inventories also estimate mortality from new ground plots. In these cases, mortality is estimated from either a mortality prediction equation that predicts the probability that a tree will die over some time period, or from a field estimate of mortality based on the measurement of dead trees and an estimate of when they died.

The items in the plot table are either observations of a specific condition at the plot center or estimates of average conditions on the area sampled by the plot. Owner group is an example of a specific condition recorded at plot center, rather than averaged over the plot. If a plot area overlaps more than one owner, the ownership at plot center determines the recorded owner group. Basal area is an example of an item averaged over the entire plot or condition.

Westwide Data Base users concerned about field procedures should check with the appropriate FIA program for more information.

The data in the WWDB are stored as consistently as possible from one State to another. Therefore, although differences in field and estimation procedures do exist between States, the data in the WWDB for different States are compatible. The minor differences that do exist should have little or no impact on most uses of these data.

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[1]The plot size of a 14.0-inch tree on a single 40 BAF (English) angle gauge point would be:

$$(14.0^2 \times \pi)/(40 \times 2^2 \times 12^2) = 0.0267 \text{ acres.}$$

The plot size of this tree for a 5-point cluster would be 5 x 0.0267, which equals 0.134 acres, producing an expansion factor of 7.48 (1/0.134).

Accuracy Standards

Forest inventory plans are designed to meet sampling error standards for area, volume, and growth provided in the Forest Survey Handbook (FSH 4809.11). These standards, along with other guidelines, are aimed at obtaining comprehensive and comparable information on timber resources for all parts of the country. In the West, FIA inventories are commonly designed to meet the specified sampling errors at the State level at the 67 percent confidence limit (one standard error). A 3 percent error at a million acres of timberland is the maximum allowable sampling error for area. A 10 percent error at a billion cubic feet of growing stock on timberland is the sampling error maximum for volume and net annual growth.

Caution: FIA inventories are extensive inventories that provide reliable estimates for large sampling areas. As data are subdivided into smaller and smaller areas, such as a geographic unit or a county, the sampling errors increase and the reliability of the estimates decreases. For example, a State with 5 million acres of timberland would have a maximum allowable sampling error for area of 1.3 percent. A geographic unit within that State with 1 million acres of timberland would have a 3.0 percent maximum allowable sampling error, and a county within that State with 100,000 acres would have a 9.5 percent maximum allowable sampling error at the 67 percent level.

A stratified double sample with detailed county and owner photo interpretation stratum weights is used to produce the published estimates. In the WWDB, however, a plot expansion approach is used so that area factors can be assigned to each plot. Therefore, making a query at a specific county or owner level may not result in an estimate that matches the published estimate.

CHAPTER 3—DATA BASE STRUCTURE

The Westwide Data Base is a relational data base structured for the ORACLE Data Base Management System. By the nature of the way FIA data are collected and compiled, the three ORACLE tables (County Table, Plot Table, and Tree Table) appear and are indeed hierarchical. This structure makes it easy to produce flat files for customers who do not have access to, or the capability of, data base management on their computer system.

For each data item in a table, there is a section that describes the unabbreviated name for the data item and provides a detailed description on how the item was measured or estimated and how it can be used. For coded items, a list of the codes and their meanings is also given.

Following is an extract of the schema of the Data Base showing the column name of each data item in the separate tables and the structure of each item in a table. After each schema is a dictionary with the meaning of each column name and information describing the derivation of the item.

County Table

Column name	ORACLE format	Restrictions	Unit of measure	Key data item
1. STATE	NUMBER (2)	NOT NULL	Coded	X
2. UNIT	NUMBER (2)	NOT NULL	Coded	X
3. COUNTY	NUMBER (3)	NOT NULL	Coded	X
4. CTYNAM	CHAR (28)		Name	
5. STATEABB	CHAR (2)		Name	
6. CYCLE	NUMBER (2)		Number	
7. INVYEAR	NUMBER (4)		Year	
8. CENYEAR	NUMBER (4)		Year	
9. NFSYEAR	NUMBER (4)		Year	

1. STATE   State code—The Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the State. For States in the WWDB, these codes are shown in appendix B.

2. UNIT   Survey unit number—Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State used primarily for reporting purposes. However, a county may have more than one UNIT code depending on the occurrence of National Forests or areas separated for a particular reason, such as using a different sampling intensity on tribal trust lands. See appendix C for codes.

3. COUNTY   County code—A code for each county, watershed, borough, or similar governmental unit in a State. Federal Information Processing Standards codes from the Bureau of the Census, 1990, are used if a single county is represented. See appendix D for specific codes.

4. CTYNAM   County name—County name as recorded by the Bureau of the Census, 1990, for individual counties, or the name given to a similar governmental unit by the FIA program. County names are left justified. Only the first 28 characters of the name are used. See appendix D for names.

5. STATEABB   State abbreviation—The two-character State abbreviation. See appendix B for codes.

6. CYCLE   Inventory cycle number—Identifies the current cycle number for the data in the data base. For example, a 4 would indicate the data came from the fourth inventory of that State. A cycle number greater than 1 does not necessarily mean information for previous cycles resides in the data base.

7. INVYEAR   Year of inventory—The calendar year that the current inventory data represent—for example, 1994. The FIA data are often collected over more than 1 year; however, a specific year is selected that indicates when most data were collected. The FIA publications based on an inventory are said to be an analysis of the forest resource as of this date.

8. CENYEAR   Census year—The year (for example, 1980, 1990) of the Bureau of the Census land area figures, to which total State land area is reconciled.

9. NFSYEAR   National Forest System Area Control Year—The year that the National Forest System area is reconciled to, which coincides with a particular "Land Areas of the National Forest System" report.

Plot Table

Column name	ORACLE format	Restrictions	Unit of measure	Coded on[1]	Key data items
1. STATE	NUMBER (2)	NOT NULL	Coded	A	X
2. UNIT	NUMBER (2)	NOT NULL	Coded	A	X
3. COUNTY	NUMBER (3)	NOT NULL	Coded	A	X
4. PLTNUM	NUMBER (5)	NOT NULL	Number	A	X
5. COND	NUMBER (1)	NOT NULL	Number	A	X
6. OWNER	NUMBER (2)		Coded	F	
7. OWNGRP	NUMBER (1)		Coded	F	
8. TYPCUR	NUMBER (3)		Coded	F	
9. TYPOLD	NUMBER (3)		Coded	F	
10. STDAGE	NUMBER (3)		Years	F	
11. STDSIZE	NUMBER (1)		Coded	F	
12. SITECL	NUMBER (1)		Coded	F	
13. SI	NUMBER (3)		Feet	F	
14. SIAGE	NUMBER (2)		Years	T	
15. ADFOR	NUMBER (3)		Coded	A	
16. RESERVCL	NUMBER (3)		Coded	A	
17. LCCUR	NUMBER (1)		Coded	A	
18. LCOLD	NUMBER (1)		Coded	A	
19. BA	NUMBER (3)		Sq. ft.	F	
20. SLOPE	NUMBER (3)		Percent	F	
21. ELEV	NUMBER (3)		100's of feet	F	
22. ASPECT	NUMBER (3)		Degrees	F	
23. SOILGRP	NUMBER (1)		Coded	F	
24. TREATOP	NUMBER (2)		Coded	N	
25. PNC	CHAR (6)		Coded	O	
26. INHIBPC	NUMBER (2)		Percent	T	
27. NONSTPC	NUMBER (2)		Percent	T	
28. GRSTKPC	NUMBER (3)		Percent	T	
29. ALSTKPC	NUMBER (3)		Percent	T	
30. REMPER	NUMBER (3,1)		Years	A	
31. EXPACR	NUMBER (10,3)		Acres	A	
32. EXPVOL	NUMBER (10,3)		Acres	A	
33. EXPGRO	NUMBER (10,3)		Acres	A	
34. EXPMOR	NUMBER (10,3)		Acres	A	
35. LON	NUMBER (7)		100 Seconds	A	
36. LAT	NUMBER (7)		100 Seconds	A	
37. MDATE	NUMBER (4)		Year-month	A	

[1] A = Recorded on all plots
F = Recorded on all forested plots (LCCUR = 1)
T = Recorded on all timberland plots (LCCUR = 1, TYPCUR not = 288, 290, 293, or 297)
O = Recorded on all timberland plots, optional on woodland (TYPCUR = 288, 290, 293, or 297)
N = Nonindustrial private forest land RPA requirement, optional on all other forest land
The value will be null for plots where the item has not been recorded.

1. STATE   State code—The Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the State. For States in the WWDB, see appendix B for codes.

2. UNIT   Survey unit number—Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State used primarily for reporting purposes. However, a county may have more than one UNIT code depending on the occurrence of National Forests or areas separated for a particular reason, such as using a different sampling intensity on tribal trust lands. See appendix C for codes.

3. COUNTY   County code—The code for each county, watershed, borough, or other similar governmental unit in a State. Federal Information Processing Standards codes from the

Bureau of the Census, 1990, are used if a single county is represented. See appendix D for specific codes.

4. PLTNUM   Plot number—Plot numbers are unique within county and survey unit.

5. COND   Condition number—A consecutive number that indicates the number of different forest conditions found while sampling an individual plot. This is an arbitrary number used to identify and map the different land classes and forest types occurring on a plot. Once a number has been assigned, the number will be reused whenever the same condition is encountered on the plot.

6. OWNER   Owner—Legal owner of the plot at the time of the current inventory.

Code	Owner class	Definition
01	Census water	Streams, sloughs, estuaries, and canals more than $\frac{1}{8}$ of a statute mile (660 ft) wide, and lakes, reservoirs, and ponds more than 40 acres in size.
09	National Park Service	Lands administered by USDI National Park Service.
11	National Forest	Lands administered by USDA Forest Service, National Forest System.
12	Bureau of Land Management	Lands administered by USDI Bureau of Land Management.
13	Tribal trust	Lands held in trust by the Federal Government for a Native American tribe or individual.
14	Miscellaneous Federal	Lands administered by Federal agencies other than the Forest Service, the Bureau of Land Management, or National Park Service.
15	State	Lands owned by State governments, or lands leased by State governmental units for more than 50 years.
16	County and Municipal	Lands owned by county or municipal agencies, or lands leased by these agencies for more than 50 years.

20	Forest industry	Lands owned by companies or individuals operating a primary wood-processing plant, either within the State's boundaries or in nearby States or Provinces.
40	Farmer/rancher	Lands owned by a person who operates a farm or a ranch and who either does or directly supervises the work.
60	Other private-corporate	Lands owned by private corporations other than forest industry or farmers.
70	Other private-individual	Lands owned by individuals other than farmers.
80	Undifferentiated-private	Used in counties where a more specific ownership code might disclose information about an individual land owner.

7. OWNGRP   Owner group code—Legal owner of the plot at the time of the current inventory.

Code	Owner group	Definition
1	National Forest	Lands administered by Forest Service, National Forest System.
2	Other public	Publicly administered lands, other than National Forest land.
3	Forest industry	Lands owned by companies or individuals operating wood-processing plants.
4	Nonindustrial private	All private lands except those owned by forest industry. (This group can include Tribal trust lands.) This group code is also used for all private land owners in counties where it was necessary to use owner code 80.

8. TYPCUR   Current forest type—The predominant forest type of the area where the plot is located. This type is based on the tree species that forms a plurality of all live stocking within the stand. In this three-digit coded item, the first digit represents the East/West type group and digits 2 and 3 specify a Westwide standard type, as shown in appendix E.

The following forest types occur predominantly in the Eastern United States, but are encountered in the West as well: white spruce, black spruce, and paper birch. The type list comes from the standard set of local forest types in the Forest Survey Handbook (FSH 4809.11), with several types added. Not every type is recognized in every State. The assignment of a forest type to a stand depends on the determination of stocking. Most forest types describe lands referred to as timberland, that is forest land where timber species account for a stocking value of at least 10 (base 100).

Information on how data are assigned to these types for a particular State can be obtained by contacting the appropriate FIA program.

9. TYPOLD   Old forest type—Forest type at the time of the previous survey. Criteria for assigning types and codes are the same as for TYPCUR. The TYPOLD is null for new or temporary plots.

10. STDAGE   Stand age—The age (in years) of the stand in which the plot is located (generally based on dominant and co-dominant trees or dominant size-class trees). Any inventory dated 1995 or later will contain stand ages recorded to the nearest year. For some older inventories, stand age was recorded in 10- or 20-year age classes, and the value recorded is the mid-point of the age class.

11. STDSIZE Stand-size class—A product oriented classification of forest land based on the predominant stocking by the size of all live trees present on the plot. More detailed information on how stand-size class is determined from plot data in a particular State can be obtained directly from the FIA program responsible for the inventory.

Code	Stand-size class	Definition
1	Sawtimber or large diameter woodland	Stands with an all live stocking value of at least 10 (base 100) on which more than 50 percent of the stocking is in trees 5.0 inches d.b.h. or larger, and the stocking of sawtimber-size trees is equal to or greater than the stocking of poletimber-size trees. For woodland, stands with trees predominantly 9.0 inches diameter at root collar (d.r.c.) or greater.
2	Poletimber or small diameter woodland	Stands with an all live stocking value of at least 10 (base 100) on which more than 50 percent of the stocking is in trees 5.0 inches

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d.b.h. or larger, and the
stocking of sawtimber-size
trees is less than the stock-
ing of poletimber-size trees.
For woodland, stands with
trees between 3.0 and 8.9
inches d.r.c.

</div>

3	Seedling-sapling	Stands with an all live stocking value of at least 10 (base 100) on which at least 50 percent of the stocking is in trees less than 5.0 inches d.b.h. Woodland seedling-sapling stands are composed of trees less than 3.0 inches d.r.c.
4	Nonstocked	Stands with an all live stocking value of less than 10 (base 100).

12. SITECL   Site productivity class—A classification of timberland in terms of inherent capacity to grow crops of industrial wood. The class identifies the average potential growth in cubic feet/acre/year (trees 5.0 inches d.b.h. or larger to a 4-inch top) and is based on the culmination of mean annual increment of fully-stocked natural stands. Woodland plots are always given code 8 because site productivity is not computed due to the fact that rotation age is undefined.

Code   Site productivity class

Code	Site productivity class	
1	225+	
2	165-224	
3	120-164	*Cubic feet/*
4	85-119	*acre/year*
5	50-84	
6	20-49	
7	0-19	
8	Woodland plot	

13. SI   Site index—Site index (in feet) of the stand where the plot is located. For woodland plots, site index is the mean height of all non-suppressed live pinyon and juniper trees with a d.r.c. of 6.0 inches or larger and no top damage.

14. SIAGE   Site index base age—The base age of the site index curves used to derive site index. This item is not coded for woodland plots.

15. ADFOR   Administrative forest—A code for the National Forest where the plot is located. Present for National Forest plots only (OWNGRP = 1), null for all other owners. See appendix F for codes.

16. RESERVCL Reserved status class—A code indicating whether the plot is or is not administratively reserved from timber harvesting.

Code	Definition
1	Nonreserved
2	Reserved

17. LCCUR Current land class—A classification that indicates the basic land cover.

Code	Land class
1	Forest
2	Nonforest
3	Noncensus water
4	Census water

Land class	Definition
Forest	Forest land is defined as lands with a stocking value of at least 10 (base 100), stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land varies by unit. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.
Nonforest	Land that has never supported forests or land formerly forested but now developed for uses such as agriculture, residences, commerce, industry, city parks, or improved roads. If located within forest areas, unimproved roads and nonforested strips must be more than 120 feet wide. Clearings and other openings in a forest area must be more than 1 acre to qualify as nonforest land. Nonforest land also includes streams, sloughs, estuaries, and canals more than 120 feet wide but less than $\frac{1}{8}$ of a statute mile (660 feet) wide, lakes, reservoirs, and ponds 1 to 40 acres in size.
Noncensus water	Used only in Alaska and defined as streams, sloughs, estuaries, and canals between 120 feet and $\frac{1}{8}$ of a statute mile wide, and lakes, reservoirs, and ponds between 1 and 40 acres in area.
Census water	Streams, sloughs, estuaries, and canals more than $\frac{1}{8}$ of a statute mile (660 feet) wide, and lakes, reservoirs, and ponds more than 40 acres in size.

18. LCOLD   Old land class—Same as LCCUR at the time of the last inventory. LCOLD is null for new or temporary plots.

19. BA   Basal area—The summed cross sectional area of all live timber species multiplied by trees per acre (TREE Table) on the plot that are 1.0 inch or larger d.b.h. Calculated in square feet per acre.

20. SLOPE   Slope—The average percentage of the deviation from the horizontal over the sample site. Valid values are 0 through 200.

21. ELEV   Elevation—The distance the plot is located above sea level, recorded in 100's of feet.

22. ASPECT   Aspect—The direction of drainage for most of the plot, recorded as the azimuth of this direction. Valid values are 1 through 360. When slope is zero, there is no aspect and this item is null.

23. SOILGRP   Soil group—An indication of soil limits for tree root development.

Code	Soil group
1	Very shallow—less than 10 inches deep
2	Shallow—10 to 20 inches deep
3	Deep or moderately deep—more than 20 inches deep
4	Coarse soils—more than 50 percent of the soil in the top 20 inches is made up of fragments coarser than sandy loam

24. TREATOP   Treatment opportunity class—Identifies the physical opportunity to improve stand conditions by applying management practices. The 11 classes are:

Code	Treatment opportunity class	Definition
1	Regeneration without site preparation	The area is characterized by the absence of a manageable stand because of inadequate stocking of growing stock. Growth will be much below the potential for the site if the area is left alone. Prospects are not good for natural regeneration. Artificial regeneration will require little or no site preparation.
2	Regeneration with site preparation	The area is characterized by the absence of a manageable stand because of inadequate stocking of growing stock. Growth will be much below the potential for the

			site if the area is left alone. Either natural or artificial regeneration will require site preparation.
3		Stand conversion	The area is characterized by stands of undesirable, chronically diseased, or off-site (found where not normally expected) species. Growth and quality will be much below the potential for the site if the area is left alone. The best prospect is for conversion to a different forest type or species.
4		Thinning seedlings and saplings	The stand is characterized by a dense stocking of growing stock. Stagnation appears likely if left alone. Stocking must be reduced to help crop trees attain dominance.
5		Thinning poletimber	The stand is characterized by a dense stocking of growing stock. Stocking must be reduced to prevent stagnation or to confine growth to selected, high-quality crop trees.
6		Other stocking control	The stand is characterized by an adequate stocking of seedlings, saplings, or poletimber growing stock, or a combination, mixed with competing vegetation either overtopping or otherwise inhibiting the development of crop trees. The undesirable material must be removed to release overtopped trees, to prevent stagnation, or to improve composition, form, or growth of the residual stand.
7		Other intermediate treatments	The stand would benefit from other special treatments, such as fertilization to improve the growth potential of the site, and pruning to improve the quality of individual crop trees.

	8	Clearcut harvest	The area is characterized by a mature or overmature sawtimber stand of sufficient volume to justify a commercial harvest. The best prospect is to harvest the stand and regenerate.
	9	Partial cut harvest	The stand is characterized by poletimber- or sawtimber-size trees with sufficient merchantable volume for a commercial harvest, which will meet intermediate stand treatment needs or prepare the stand for natural regeneration. The stand is of a favored species composition and may be even or uneven aged. Included are such treatments as commercial thinning, seed tree or shelterwood regeneration, and use of the selection system to maintain an uneven age stand.
	10	Salvage harvest	The stand is characterized by excessive damage to merchantable timber because of fire, insects, disease, wind, ice, or other destructive agents. The best prospect is to remove damaged or threatened material.
	11	No treatment	Stand is characterized by an adequate stock of growing-stock trees in reasonably good condition.

25. PNC   Potential natural community—A code describing the biotic community that is assumed to become established if all successional sequences of its ecosystem were completed without additional human-caused disturbance under present environmental conditions (Daubenmire 1952, 1968, 1976; Mueller-Dombois and Ellenberg 1974). Potential natural community has replaced the term "climax" in much of the current literature. Other terms used synonymously with potential natural community are plant association, habitat type, and range site. Definitions of codes used for a particular State can be obtained by contacting the appropriate FIA program.

26. INHIBPC   Percent inhibiting vegetation—Percent of the area covered by inhibiting vegetation (0-100 percent basis). A value of

99 is recorded for areas that are entirely (100 percent) covered with inhibiting vegetation.

27. **NONSTPC** Percent nonstocked—Percent of the area that is nonstocked with all live trees (0-100 percent basis). A value of 99 is recorded for plots that have no live stocking (100 percent nonstocked).

28. **GRSTKPC** Growing-stock stocking—Stocking of the plot by growing-stock trees. Data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values are determined from plot data in a particular State can be obtained directly from the FIA program responsible for the inventory.

29. **ALSTKPC** All live stocking—Stocking of the plot by live trees of any non-woodland species. (Stocking is not computed for woodland species.) Data are in the form of absolute stocking value (0-167).

30. **REMPER** Remeasurement period—The number of years between measurements of remeasured plots. This item is null for new or temporary plots. Remeasurement period is based on the number of growing seasons between measurements. Allocation of parts of the growing season by month is different for each FIA program. Contact the FIA program for information on how this is done for a particular State.

31. **EXPACR** Area expansion factor—The number of acres the sample plot represents for estimating area variables such as ownership and land class. The sum of EXPACR over all plot level records for a particular State is the total land and water area of the State.

32. **EXPVOL** Volume expansion factor—The number of acres that the sample plot represents for estimating current volume and number of trees. Volume will be "expanded" over the appropriate acreage by multiplying EXPVOL times the product of the volume item and trees per acre item (TREE table). Total volume in a State is calculated by summing the expanded volume estimates from all trees on all plots in a particular State in the WWDB. Number of trees is expanded in a similar way.

33. **EXPGRO** Growth expansion factor—The number of acres that the sample plot represents for estimating growth. This value is usually equal to EXPVOL. Growth will be "expanded" over the appropriate acreage by multiplying EXPGRO times the product of the growth item and the trees per acre item (TREE table). Total growth in a State is calculated by summing these expanded estimates from all trees on all plots in a particular State in the WWDB. Some plots will not have a value for this item. In some State inventories, growth is only estimated on remeasured plots. In such cases, this item would be null for new or temporary plots.

34. **EXPMOR** Mortality expansion factor—The number of acres that the sample plot represents for estimating mortality. This value is usually equal to EXPVOL. Mortality will be

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"expanded" over the appropriate acreage by multiplying EXPMOR times the product of the volume item and the mortality trees per acre item (TREE table). Total mortality in a State is calculated by summing these expanded estimates from all trees on all plots in a particular State in the WWDB. Some plots will not have a value for this item. In some State inventories, mortality is only estimated on remeasured plots. In such cases, this item would be null for new or temporary plots.

35. LON   Longitude—The longitude of the plot rounded to the nearest 100 seconds. The precision of this item along the parallel is ± 1095.2 m at latitude 45°.

36. LAT   Latitude—The latitude of the plot rounded to the nearest 100 seconds. The precision of this item along the meridian is ± 1543.6 m at latitude 45°.

37. MDATE   Measurement date—The date the plot was actually measured. This date is coded YYMM where YY is the last 2 digits of the year (95 for 1995) and MM is the month (02 for February). This date may differ from INVYEAR in the COUNTY table.

Tree Table

Column name	ORACLE format	Restrictions	Unit of measure	Key data item
1. STATE	NUMBER (2)	NOT NULL	Coded	X
2. UNIT	NUMBER (2)	NOT NULL	Coded	X
3. COUNTY	NUMBER (3)	NOT NULL	Coded	X
4. PLTNUM	NUMBER (5)	NOT NULL	Number	X
5. COND	NUMBER (1)	NOT NULL	Number	X
6. POINT	NUMBER (2)	NOT NULL	Number	X
7. TREE	NUMBER (3)	NOT NULL	Number	X
8. STATUS	NUMBER (1)		Coded	
9. SPP	NUMBER (3)		Coded	
10. SPPGRP	NUMBER (2)		Coded	
11. DIACUR	NUMBER (3,1)		Inches	
12. DIAOLD	NUMBER (3,1)		Inches	
13. HT	NUMBER (3)		Feet	
14. TCLASS	NUMBER (1)		Coded	
15. CRATIO	NUMBER (1)		Coded	
16. CRCLS	NUMBER (1)		Coded	
17. DAMAGE	NUMBER (2)		Coded	
18. TPA	NUMBER (8,3)		Trees/acre	
19. MTPA	NUMBER (8,3)		Trees/acre/yr.	
20. NETCFVL	NUMBER (8,3)		Cu. ft./tree	
21. NETCFSL	NUMBER (8,3)		Cu. ft./tree	
22. NETBFVL	NUMBER (8,3)		Bd. ft./tree	
23. LOCALVL	NUMBER (8,3)		Bd. ft./tree	
24. NETCFGR	NUMBER (8,3)		Cu. ft./year	
25. NETBFGR	NUMBER (8,3)		Bd. ft./year	
26. LOCALGR	NUMBER (8,3)		Bd. ft./year	
27. TBIODRY	NUMBER (6)		Oven-dry lbs.	
28. MBIODRY	NUMBER (6)		Oven-dry lbs.	

1. STATE   State code—The Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the State. See appendix B for States in the WWDB.

2. UNIT   Survey unit number—Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State used primarily for reporting purposes. However, a county may have more than one UNIT code depending on the occurrence of National Forests or areas separated for a particular reason, such as using a different sampling intensity on tribal trust lands. See appendix C for codes.

3. COUNTY   County code—The code for each county, watershed, borough, or other similar governmental unit in a State. FIPS codes from the Bureau of the Census, 1990, are used if a single county is represented. See appendix D for specific codes.

4. PLTNUM   Plot number—Plot numbers are unique within county and survey unit.

5. COND   Condition number—A consecutive number that indicates the number of different forest conditions found while sampling an individual plot. This is an arbitrary number used to identify and map the different land classes and forest types occurring on a plot. Once a number has been assigned, the number will be reused whenever the same condition is encountered on the plot.

6. POINT   Point number—Point number used to identify on which point (of the sample cluster) the tree was measured.

7. TREE   Tree number—A number used to uniquely identify a tree on a point.

8. STATUS   Tree status—A code that identifies whether the sample tree is live, cut, or dead.

Code	Tree status
1	Live
2	Dead (not sound)
3	Cut (only used on remeasurement plots)
4	Sound dead

9. SPP   Species code—A standard tree species code. Codes for trees in the WWDB are listed in appendix G.

10. SPPGRP   Species group—A Westwide species group number. This number is used to produce many of the core tables. The assignment of individual species (SPP) to these groups is shown in appendix H. Individual FIA programs may further break these species groups down for published tables, but this is a common list that all published core tables must match.

11. DIACUR   Current diameter—The current diameter of the sample timber species tree at breast height (in inches, to the last $\frac{1}{10}$ inch). If the bark has fallen off the tree, an estimated bark thickness is used to obtain this diameter so that it is an estimator of the diameter at the time the tree died. For

cut trees (STATUS = 3), the value in this item is different depending on which FIA program produced the data. The INT FIA program measures the diameter of a cut tree's stump (usually a 1-foot stump). Also, the INT FIA program measures the diameter of some tree species at root collar. See appendix G to determine the measurement point.

12. DIAOLD   Old diameter—The diameter of the sample timber species tree at breast height recorded at the previous measurement (in inches, to the last $\frac{1}{10}$ inch). Again, the INT FIA program measures the diameter of some tree species at root collar.

13. HT   Height—The total height of a sample tree, measured (in feet) from the ground to the top of the main stem. If the main stem is broken, the standing height is measured and either the correct amount added if the piece is on the ground, or estimated if missing, then added to standing height.

14. TCLASS   Tree class—A code for the general quality of the tree. For cut, dead, and sound dead trees, TCLASS reflects conditions at the time the tree died or was cut. The following classes are represented:

Code	Tree class	Definition
1	Woodland tree	Live tree species that include pinyon, juniper, willow, oak, mesquite, acacia, ironwood, locust, yew, mountain-mahogany (*Cercocarpus* spp.), Rocky Mountain maple, and bigtooth maple. (Species not listed above are considered timber species).
2	Growing stock	All live timber species, except rough or rotten trees.
3	Rough cull	Live timber species that do not now, or prospectively, have at least one solid 8-foot section reasonably free of form defect on the merchantable bole, or have 67 percent or more of the merchantable volume cull, and more than half of this cull due to sound dead wood cubic-foot loss or severe form defect volume loss, or both.
4	Rotten cull	Live timber species with 67 percent or more of the merchantable volume cull, and more than half of this cull due to rotten or missing cubic-foot volume loss, or both.

15. CRATIO   Crown ratio—A code that indicates the percent of the compacted portion of the tree bole supporting live, healthy foliage when compared to total height. Expressed as a percent of total tree height to the nearest 10 percent and recorded as a one-digit code for all trees 1.0 inch d.b.h. and larger. This item is not recorded for woodland trees.

Code	Crown ratio
1	0-10 percent
2	11-20 percent
3	21-30 percent
4	31-40 percent
5	41-50 percent
6	51-60 percent
7	61-70 percent
8	71-80 percent
9	81-100 percent

16. CRCLS   Crown class—A code that primarily indicates the amount of sunlight received as opposed to the conventional "crown position" found in forestry textbooks. This item is not recorded for woodland trees. The following classes are recorded:

Code	Crown class	Definition
1	Open grown	Trees with crowns that have received full light from above and from all sides throughout all or most of their life, particularly during early development.
2	Dominant	Trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the sides; larger than the average trees in the stand, and with crowns well developed, but possibly somewhat crowded on the sides.
3	Codominant	Trees with crowns forming part of the general level of the crown cover and receiving full light from above, but comparatively little from the side—usually with medium size crowns more or less crowded on the sides.
4	Intermediate	Trees shorter than those in the preceding two classes, with crowns either below or

extending into the canopy formed by the dominant and codominant trees, receiving little direct light from above, and none from the sides; usually with small crowns very crowded on the sides.

| | 5 | Overtopped | Trees with crowns entirely below the general canopy level and receiving no direct light either from above or the sides. |

17. DAMAGE Damage—Damage is recorded for live trees if the presence of damage or pathogen activity is serious enough to reduce the quality or vigor of the tree. When a tree is damaged by more than one agent, the most severe damage is coded. When no damage is observed on a live tree, 00 is recorded. Damage recorded for dead trees is the cause of death. When the cause of death cannot be determined for a tree, 00 is recorded. Each FIA program records specific codes that may differ from one State to the next. These codes fall within the following ranges. For the specific codes used in a particular State, contact the FIA program responsible for that State.

Codes	Cause of damage
00	No damage or unknown cause of death
10-19	Insect
20-29	Disease
30-39	Fire
40-49	Animal
50-59	Weather
60-69	Suppression
70-79	Miscellaneous
80-89	Logging/human

18. TPA Trees per acre—The number of trees per acre (current) that the tree represents for calculating volume, biomass, number of trees, and growth. Per tree values are calculated by multiplying TPA times (NETCFVL, NETCFSL, NETBFVL, LOCALVL, TBIODRY, MBIODRY, NETCFGR, NETBFGR, or LOCALGR) for each tree (TREE table). Totals are calculated by summing the product of the per acre values and the appropriate area expander from the plot table. TPA is synonymous with VOLFAC in the Eastwide data base.

19. MTPA Mortality trees per acre per year—The number of trees per acre per year that the tree represents for calculating mortality. Mortality per acre is calculated by multiplying MTPA times (NETCFGR, NETBFGR, or LOCALGR) for each tree (TREE table). Total mortality is calculated by summing the product of the per acre mortality and the

appropriate area expander from the plot table. This item is null if the tree does not contribute to the mortality value. MTPA is synonymous with MORTFAC in the Eastwide data base.

20. NETCFVL   Net cubic-foot volume—The net volume of wood in the central stem of a sample tree 5.0 inches d.b.h. or larger from a 1-foot stump to a minimum 4-inch top d.o.b. or to where the central stem breaks into limbs all of which are less than 4.0 inches d.o.b. This is a per tree value and must be multiplied by TPA to obtain per acre information. This item is null for timber species with DIACUR less than 5.0. All timber species with DIACUR 5.0 or larger (including dead and sound dead) have entries for this item. If TCLASS equals 1 (woodland species), then volume is calculated for trees with a value of 3.0 or greater in the DIACUR item.

21. NETCFSL   Net cubic-foot volume in the sawlog portion—The net volume of wood in the central stem of a sample timber species of sawtimber size (9.0 inches d.b.h. minimum for softwoods, 11.0 inches d.b.h. minimum for hardwoods) from a 1-foot stump to a minimum top d.o.b. (7.0 inches for softwoods, 9.0 inches for hardwoods) or to where the central stem breaks into limbs, all of which are less than the minimum top d.o.b. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. This item is null for timber species with DIACUR less than 9.0 (11.0 for hardwoods). All larger trees have entries for this item if they are growing-stock trees (TCLASS = 2). This item is null for all rough, rotten, and woodland trees (TCLASS = 3, 4, or 1).

22. NETBFVL   Net board-foot volume in the sawlog portion—The net volume of wood in the central stem of a sample commercial tree species of sawtimber size (9.0 inches d.b.h. minimum for softwoods, 11.0 inches d.b.h. minimum for hardwoods) from a 1-foot stump to a minimum top d.o.b. (7.0 inches for softwoods, 9.0 inches for hardwoods) or to where the central stem breaks into limbs all of which are less than the minimum top d.o.b. Volume is based on International ¼-inch rule. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. This item is null for timber species with DIACUR less than 9.0 (11.0 for hardwoods). All larger trees should have entries for this item if they are growing-stock trees (TCLASS = 2) or MTPA is greater than 0. This item is null for all rough, rotten, and woodland trees (TCLASS = 3, 4, or 1).

23. LOCALVL   Local net board-foot volume—Scribner rule is used by the Western FIA programs, and has a definition similar to NETBFVL, above. (Portland PNW FIA uses an 11.0-inch d.b.h. minimum for softwoods).

24. NETCFGR   Net cubic-foot growth—The net change in cubic-foot volume per year that this tree represents. Because this value is net growth, it may be a negative number. Negative

growth values are usually due to mortality but can also occur on live trees that have a net loss in volume because of damage, rot, or other causes. If STATUS equals 1 then net cubic-foot growth on a per acre basis is computed by taking the product of this number and TPA. If STATUS equals 2 or 4 and there is a value in this item, then the product of this value times MTPA yields net negative growth. To obtain mortality, multiply the result by –1 or take the absolute value. In the West, this value represents current annual growth.

25. NETBFGR Net board-foot growth—The net change in International ¼-inch rule board-foot volume per year that this tree represents. This may be a negative number. Net board-foot growth on a per acre basis is computed by taking the product of this number and TPA.

26. LOCALGR Local net board-foot growth—Scribner rule is used by Western FIA programs, and is defined similarly to NETBFGR, above.

27. TBIODRY Total gross biomass oven-dry weight—The total above-ground biomass of a sample tree 1.0 inch diameter or larger, including all tops and limbs. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Calculated in oven-dry pounds per tree. This item should have an entry if DIACUR is 1.0 or larger, regardless of status or TCLASS; null otherwise.

28. MBIODRY Merchantable biomass oven-dry weight—The total gross biomass of a tree 5.0 inches d.b.h. or larger from a 1-foot stump to a minimum 4-inch top d.o.b. of the central stem. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Calculated in oven-dry pounds per tree. This item should have an entry if DIACUR is 5.0 or larger, and TCLASS = 2, 3, 4; null otherwise. For dead or cut trees, this number represents biomass at the time of death or last measurement.

CHAPTER 4—USING THE WESTWIDE DATA BASE

The Westwide Data Base tables can be transferred to another ORACLE DBMS or they can be transformed into a flat file structure. A particular hardware or software system is not important, but the system must accept input in the form of a flat ASCII or EBCDIC file up to 154 characters wide. Data base management systems that support hierarchical data structures, as well as those based on the relational model, can easily process WWDB files. Chapter 3 should give the user of almost any software package the information needed to input a WWDB file into a processing system.

To assist users of WWDB files and to provide them with a benchmark or checkpoint for comparison to their own data processing systems, a set of the core tables produced directly from the WWDB State file is provided with each request. Appendix A contains an example of the type of tables that would be produced.

Completed core tables for the State of interest will be sent with the WWDB data files. The WWDB users should duplicate the numbers in the core tables on their hardware. In doing so, minor differences due to rounding and machine word length may occur. Users can then screen the input data file so that it includes plot and tree records for only a limited geographic area, such as County or County groups, and can produce data summaries for only that area.

The WWDB users will need the procedures or algorithm used to compute various tree level data and expand them to population level estimates. The following tabulation summarizes how this is done for many commonly requested data items. Each "Item" is computed by summing the corresponding "Quantity" over all trees that meet "Test" requirements.

Item	Quantity	Test
Current number of trees on timberland		
All live	NTRAL=TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8
Growing stock	NTRGS=TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Rough	NTRRG=TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=3
Rotten	NTRRT=TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=4
Salvable dead	NTRSD=TPA*EXPVOL	LCCUR=1 AND STATUS=4 AND SITECL < 8
Current volume on timberland		
All live merchantable	VOLAL=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8
Growing stock	VOLGS=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Saw log portion	VOLSL=NETCFSL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Sawtimber (International ¼)	VOLSW=NETBFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Rough trees	VOLRG=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=3
Rotten trees	VOLRT=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=4
Salvable dead	VOLSD=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=4 AND SITECL < 8
Woodland species	VOLWD=NETCFVL*TPA*EXPVOL	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=1
Gross growth on timberland		
Growing stock	GROGS=NETCFGR*TPA*EXPGRO	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Sawtimber (International ¼)	GROSW=NETBFGR*TPA*EXPGRO	LCCUR=1 AND STATUS=1 AND SITECL < 8 AND TCLASS=2
Annual mortality on timberland		
Growing stock	MORGS=NETCFGR*MTPA*EXPMOR	LCCUR=1 AND STATUS IN 2,4 AND SITECL < 8 AND TCLASS=2
Sawtimber (International ¼)	MORSW=NETBFGR*MTPA*EXPMOR	LCCUR=1 AND STATUS IN 2,4 AND SITECL < 8 AND TCLASS=2
Biomass on timberland		
All live total	BIOTOT=TBIODRY*TPA*EXPVOL	LCCUR=1 AND SITECL < 8 AND STATUS=1
All live merchantable	BIOMER=MBIODRY*TPA*EXPVOL	LCCUR=1 AND SITECL < 8 AND STATUS=1
Net growth on timberland		
Growing stock	NETGS=GROGS+MORGS	
Sawtimber (International ¼)	NETSW=GROSW+MORSW	

For example, using this tabulation, compute the total number of all live trees on forest land in a State from the WWDB from that State by multiplying the value in TPA on the tree record by the value in EXPVOL on the matching plot record, and sum this product (TPA*EXPVOL) over every tree record where STATUS is equal to 1 and LCCUR on the plot record is equal to 1. If you are interested in knowing the current number of live growing stock trees 5.0 inches d.b.h. and larger, the process would be the same, except that only tree records with TCLASS equal to 2 and DIACUR equal to 5.0 and larger would be included in the summation.

Those familiar with the relational data model and the standard Structured Query Language (SQL) data base language available in many data base management systems will find it easy to load WWDB files into one of these systems and to retrieve information from a loaded data base. The two retrievals described in the previous paragraph are relatively easy to perform using SQL. The SQL query to obtain the total number of live trees on forest land in a State, for example Idaho, which is State code 16, would be:

```
select      sum(TPA*EXPVOL)
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and T.STATUS = 1
            and P.LCCUR = 1
```

and the SQL query to retrieve the same information for growing stock trees 5.0 inches d.b.h. and larger would be:

```
select      sum(TPA*EXPVOL)
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and T.STATUS = 1
            and P.LCCUR = 1
            and T.TCLASS = 2
            and T.DIACUR ≥ 5.0
```

WWDB users accessing data with SQL should begin with a SQL query designed to retrieve a known quantity in one of the core tables. Once verification of the basic retrieval is made, modification can be made to retrieve only the data of interest. For example, a user might be interested in knowing the volume of ponderosa pine sawtimber on timberland in a four-county area. Begin by testing a retrieval to get the total of ponderosa pine sawtimber, using the following SQL query:

```
select      sum(LOCALVL*TPA*EXPVOL)
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and T.SPP = 122
            and T.TCLASS = 2
            and T.STATUS = 1
            and P.SITECL < 8
```

Verify the result with the volume reported in core table 11, appendix A, and then modify the query to select only the counties of interest. This SQL query would look like this:

```
select      sum(LOCALVL*TPA*EXPVOL)
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and T.SPP = 122
            and T.TCLASS = 2
            and T.STATUS = 1
            and P.SITECL < 8
            and P.COUNTY IN (C1, C2, C3, C4)
```

where C1, C2, C3, and C4 are the county codes of the four counties of interest.

Those using WWDB files to estimate any population level quantity should always be aware of the number of plot and tree measurements that the estimate is based on. For small geographic areas or very specific criteria, the number of plots will be small. In the last example, the user could find out how many sample plots the retrieval was based on. The following retrieval would count the number of timberland plots having ponderosa pine trees of sawtimber size within the four-county area used in the last example.

```
select      count(distinct(P.COUNTY | | P.PLTNUM))
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and P.SITECL < 8
            and T.SPP = 122
            and T.STATUS = 1
            and T.TCLASS = 2
            and T.DIACUR >= 9.0
            and P.COUNTY IN (C1, C2, C3, C4)
```

To then obtain the number of trees measured that met the query criteria the following query could be run:

```
select      count(*)
from        WWDB_PLOT P, WWDB_TREE T
where       P.STATE = T.STATE
            and P.UNIT = T.UNIT
            and P.COUNTY = T.COUNTY
            and P.PLTNUM = T.PLTNUM
            and T.STATE = 16
            and P.SITECL < 8
            and T.SPP = 122
            and T.STATUS = 1
            and T.TCLASS = 2
            and T.DIACUR >= 9.0
            and P.COUNTY IN (C1, C2, C3, C4)
```

This type of information should give the WWDB user an idea of the reliability of the data retrieved from WWDB files. Retrievals based on just a few plots or trees have high sampling errors.

Westwide Data Base files for a State must be obtained from the FIA program responsible for the State's inventory (fig. 1). Westwide Data Base files can be obtained for any post-1994 State inventory, soon after the inventory compilation is completed. Files for many State inventories conducted before 1994 are also available; however, some data fields may be empty or the items may not have been collected or computed as described in this report. These inconsistencies will be described for each State in an addendum to this document. At the time of this publication (1995), files can be obtained from each program on standard nine-track tapes (1600 or 6250 BPI, ASCII, or EBCDIC) at a charge of approximately $250 per State to cover the cost of producing files and maintaining the WWDB system. In addition, WWDB files may be provided as MS-DOS ASCII files on a medium more easily read by microcomputers that use the MS-DOS operating system. Use the request form, which follows, to order a particular WWDB file. For current information on a particular State, contact the appropriate FIA program.

Cost Schedule for East-West/wide Data Sets

FIA units/programs have cooperated to develop a compatible set of forest resource information that spans the entire United States. The goal of this effort is to provide the information at the lowest possible cost to the government and the general public in the interest of full and open access to the Eastwide and Westwide standard data sets. The cost of providing this service includes costs of maintaining the data sets, reproducing the data in standard computer-compatible format, communications, supplies, handling, and administrative overhead for collections. Detailed costs as of 1994 are:

Blank nine-track tape	$25.00
Write one State data set to tape	75.00
Write an additional State data set to same tape	75.00
Administrative overhead for collection	37.50
Consultation (per hour or portion)	75.00
Maintenance (est. annual cost/No. requests)	40.00
Handling (mailing and clerical costs)	25.00

For example, cost for a typical request for two States would be as follows:

Tape	$ 25.00
State 1	75.00
State 2	75.00
Overhead	37.50
Consultation (2 @ $75)	150.00
Maintenance (2 @ $40)	80.00
Handling	25.00
Total	$467.50

This is a new service, and data for portions of the United States are still not available in this format. Accordingly, experience is limited and the estimated costs are only approximate and subject to change. In the interest of compatibility, these costs are standard for all units even though minor variations in costs for computer time, salaries, and overhead occur. As experience is accumulated, the costs can be adjusted to more closely reflect actual costs. Costs will also be adjusted to reflect improvements in computer resources and to account for the inflation of costs in salaries, maintenance, and equipment. No

distinction is made by type and affiliation of user. Costs of obtaining these data sets on special media, such as disk or 8-mm tape, would be negotiable by the source FIA depending on the availability of equipment and expertise. Each FIA unit/program may independently negotiate cooperative research agreements to share the information that they collect.

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_____
(Date)

Director (Circle appropriate Station)

Intermoutain Research Station
324 25th Street
Ogden, UT 84401

Pacific Northwest Research Station
PO Box 3890
Portland, OR 97208

Dear Colleague:

Under the authority of the Forest and Rangeland Renewable Resources Research Act of 1978 (92 Stat. 353, PL 95-307), we desire to cooperate with this Station in distributing the results of Forest Survey findings.

We are requesting data files in the WWDB format for States as described on the attachment. We agree to contribute to the Station the sum of approximately $250 per State to help defray the computer cost of compiling these data. Actual costs will be calculated using the attached cost schedule.

This contribution will be mutually beneficial because it will facilitate the dissemination of research information to interested parties, which is the aim of our organization and of this Station.

No member of, or Delegate to, Congress, or Residence Commissioner, shall be admitted to any share or part of this agreement or to any benefit that may arise therefrom, unless it is made with a corporation for its general benefit.

Sincerely,

_____
(Name of Cooperator)

_____
(Signature)

_____
(Title)

Accepted for the _____

Station _____
                        (Date)

_____
(Signature)

_____
(Title)

State inventory files being requested: (list each State and the date of the inventory)
_____
_____
_____
_____

Format:
_____Nine-track tape.
            _____1600BPI _____6250BPI (check one)
            _____ASCII   _____EBCDIC (check one)
            _____Records per block. All files are fixed length (154 characters/record).
            Indicate a number of records per block that your system can read.
_____Other format. Other formats available vary by FIA program. Check with them
            before ordering other than nine-track tapes. Describe alternative format below:

This order should be sent to:

_____
(Name)

_____
(Address)

_____

Table 1—Area by county and land class, (reporting area)[1], (date).

County[2]	Forest land				Nonforest land	All land[3]
	Timberland	Reserved timberland	Other forest land	Total		
	- - - - - - - - - - - - - - - - - - - *Thousand acres* -					

[1]Reporting area may be an individual county, but is usually a Survey Unit or Sample Area consisting of several counties.
[2]From U.S. Bureau of the Census. County groups, if data are weak or sensitive. Alaska may use borough or other areas based on survey units.
[3]From U.S. Bureau of the Census.

Table 2—Area of reserved timberland and other forest land by forest type, (reporting area), (date).

Forest type[1]	Reserved timberland	Other forest land	Total
	- - - - - - - - - - - - - - *Thousand acres* - - - - - - - - - - - - -		
Douglas-fir			
Ponderosa pine			
Western white pine			
Fir-spruce			
Hemlock-Sitka spruce			
Larch			
Lodgepole pine			
Redwood			
Pinyon-juniper			
Other softwood types			
Total softwood types			
Western hardwood types			
Total all types			

[1]Local forest types may be reported under type group names, depending on availability of data.

Table 3—Area of timberland by county and ownership class, (reporting area), (date).

	Ownership class												
	Public							Private[1]					All ownership classes
		Other public							Farmer and other private			
County	National Forest	Bureau of Land Management	Misc. Federal	State	County & municipal	Total	Total	Forest industry	Farmer	Other private	Total	Total	
						Thousand acres							

[1]Private may be collapsed or expanded, depending on availability and importance of data. _____ acres of tribal trust land are included in forest industry and _____ acres in other private.

Table 4—Area of timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group[1]				
	National Forest	Other public	Forest Industry	Other private	All owners
	- - - - - - - - - - - - - - *Thousand acres* - - - - - - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

[1]In this and other tables showing owner the ownership groups may be subdivided, depending on availability and importance of data. For example, BLM may be a separate category under other public.

Table 5—Area of timberland by ownership group and stand-size class, (reporting area), (date).

Ownership group	Stand-size class				All classes
	Sawtimber	Poletimber	Seedling/ sapling	Nonstocked	
	- - - - - - - - - - - - - - - - - *Thousand acres* - - - - - - - - - - - - - - - -				
National Forest					
Other public					
Forest industry					
Other private					
Total all owners					

Table 6—Area of timberland by ownership group and site class, (reporting area), (date).

Ownership group	Site class[1]					All classes
	>165	120-164	85-119	50-84	20-49	
	- - - - - - - - - - - - - - - - - *Thousand acres* - - - - - - - - - - - - - - -					
National Forest						
Other public						
Forest industry						
Other private						
Total all owners						

[1]Based on potential mean annual increment at culmination in fully stocked natural stands. Additional site class categories may be shown at local option.

Table 7—Area of timberland by forest type and stand-size class, (reporting area), (date).

Forest type	Stand-size class				All classes
	Sawtimber	Poletimber	Seeding/ sapling	Nonstocked	
	----------------- *Thousand acres* -------------				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 8—Number of live trees on timberland by species and diameter class, (reporting area), (date).

Species[1]	Diameter class (inches at breast height)														All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
	--- Thousand trees ---														
Douglas-fir															
Ponderosa and Jeffrey pines															
True fir															
Western hemlock															
Lodgepole pine															
Sugar pine															
Western white pine															
Redwood															
Sitka spruce															
Englemann and other spruce															
Western larch															
Incense-cedar															
Western redcedar															
Other western softwoods															
Total softwoods															
Aspen and cottonwood															
Red alder															
Oak															
Other western hardwoods															
Total hardwoods															
Total all species															

[1] Additional species detail may be shown for a reporting area.

Table 9—Number of growing stock trees on timberland by species and diameter class, (reporting area), (date).

Species	Diameter class (inches at breast height)													All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
	------ Thousand trees ------													
Douglas-fir														
Ponderosa and Jeffrey pines														
True fir														
Western hemlock														
Lodgepole pine														
Sugar pine														
Western white pine														
Redwood														
Sitka spruce														
Englemann and other spruce														
Western larch														
Incense-cedar														
Western redcedar														
Other western softwoods														
Total softwoods														
Aspen and cottonwood														
Red alder														
Oak														
Other western hardwoods														
Total hardwoods														
Total all species														

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Table 10—Net volume of growing stock on timberland by species and diameter class, (reporting area), (date).

Species	Diameter class (inches at breast height)												All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
	-- Thousand cubic feet --												
Douglas-fir													
Ponderosa and Jeffrey pines													
True fir													
Western hemlock													
Lodgepole pine													
Sugar pine													
Western white pine													
Redwood													
Sitka spruce													
Englemann and other spruce													
Western larch													
Incense-cedar													
Western redcedar													
Other western softwoods													
Total softwoods													
Aspen and cottonwood													
Red alder													
Oak													
Other western hardwoods													
Total hardwoods													
Total all species													

Table 11—Net volume of sawtimber on timberland by species and diameter class, (reporting area), (date).

Species	Diameter class (inches at breast height)									All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	---------- Thousand board feet, Scribner rule ----------									
Douglas-fir										
Ponderosa and Jeffrey pines										
True fir										
Western hemlock										
Lodgepole pine										
Sugar pine										
Western white pine										
Redwood										
Sitka spruce										
Englemann and other spruce										
Western larch										
Incense-cedar										
Western redcedar										
Other western softwoods										
Total softwoods										
Aspen and cottonwood	XXX									
Red alder	XXX									
Oak	XXX									
Other western hardwoods	XXX									
Total hardwoods	XXX									
Total all species										

Table 12—Net volume of growing stock on timberland by species and ownership group, (reporting area), (date).

Species	National Forest	Other public	Forest industry	Other private	All owners
			Ownership group		
		Thousand cubic feet			
Douglas-fir					
Ponderosa and Jeffrey pines					
True fir					
Western hemlock					
Lodgepole pine					
Sugar pine					
Western white pine					
Redwood					
Sitka spruce					
Englemann and other spruce					
Western larch					
Incense-cedar					
Western redcedar					
Other western softwoods					
Total softwoods					
Aspen and cottonwood					
Red alder					
Oak					
Other western hardwoods					
Total hardwoods					
Total all species					

Table 13—Net volume of sawtimber on timberland by species and ownership group, (reporting area), (date).

Species	National Forest	Other public	Forest industry	Other private	All owners
			Ownership group		
		Thousand board feet, Scribner rule			
Douglas-fir					
Ponderosa and Jeffrey pines					
True fir					
Western hemlock					
Lodgepole pine					
Sugar pine					
Western white pine					
Redwood					
Sitka spruce					
Englemann and other spruce					
Western larch					
Incense-cedar					
Western redcedar					
Other western softwoods					
Total softwoods					
Aspen and cottonwood					
Red alder					
Oak					
Other western hardwoods					
Total hardwoods					
Total all species					

Table 14—Net volume of growing stock on timberland by forest type and stand-size class, (reporting area), (date).

Forest type	Stand-size class				All classes
	Sawtimber	Poletimber	Seedling/ sapling	Nonstocked	
	- - - - - - - - - - - - - - *Thousand cubic feet* - - - - - - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 15—Net volume of sawtimber on timberland by forest type and stand-size class, (reporting area), (date).

Forest type	Stand-size class				All classes
	Sawtimber	Poletimber	Seedling/ sapling	Nonstocked	
	- - - - - - - - - - *Thousand board feet, Scribner rule* - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 16—Net volume of growing stock on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				All owners
	National Forest	Other public	Forest industry	Other private	
	- - - - - - - - - - - - - - Thousand cubic feet - - - - - - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 17—Net volume of sawtimber on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				All owners
	National Forest	Other public	Forest industry	Other private	
	- - - - - - - - - - Thousand board feet, Scribner rule - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 18—Net volume of timber on timberland by class of timber and species group, (reporting area), (date).

Class of timber	Species group		All species
	Softwoods	Hardwoods	
	------------ *Thousand cubic feet* -------------		
Sawtimber trees			
Sawlog portion			
Upper-stem portion			
Total			
Poletimber trees			
All growing-stock trees			
Sound cull trees			
Rotten cull trees			
Total cull			
Salvable dead trees			
Total all timber			

Table 19—Average net annual growth of growing stock on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				
	National Forest	Other public	Forest industry	Other private	All owners
	--------------- *Thousand cubic feet* -------------				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 20—Average net annual growth of sawtimber on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				
	National Forest	Other public	Forest Industry	Other private	All owners
	- - - - - - - - - - - *Thousand board feet, Scribner rule* - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 21—Average annual mortality of growing stock on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				
	National Forest	Other public	Forest industry	Other private	All owners
	- - - - - - - - - - - - - *Thousand cubic feet* - - - - - - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

Table 22—Average annual mortality of sawtimber on timberland by forest type and ownership group, (reporting area), (date).

Forest type	Ownership group				
	National Forest	Other public	Forest Industry	Other private	All owners
	- - - - - - - - - - *Thousand board feet, Scribner rule* - - - - - - - -				
Douglas-fir					
Ponderosa pine					
Western white pine					
Fir-spruce					
Hemlock-Sitka spruce					
Larch					
Lodgepole pine					
Redwood					
Other softwood types					
Total softwood types					
Western hardwood types					
Total all types					

APPENDIX B—STATE CODES AND NAMES

Code	State abbreviation	State
02	AK	Alaska
04	AZ	Arizona
06	CA	California
08	CO	Colorado
15	HI	Hawaii
16	ID	Idaho
30	MT	Montana
32	NV	Nevada
35	NM	New Mexico
41	OR	Oregon
49	UT	Utah
53	WA	Washington
56	WY	Wyoming

APPENDIX C—UNIT CODES AND NAMES

The Survey Unit codes found below primarily show how counties are grouped for Forest Inventory and Analysis reports on lands outside National Forests. Field plots in any given County may have a Survey Unit code that is not on this list. Plots on National Forests or other areas separated for a particular reason, such as using a different sampling intensity, will have unique codes. Codes not documented herein will be described for each State in an addendum to this document.

Intermountain

Arizona Survey Units

1	Southern		2	Northern
003	Cochise		001	Apache
009	Graham		005	Coconino
011	Greenlee		007	Gila
012	La Paz		015	Mohave
013	Maricopa		017	Navajo
019	Pima		025	Yavapai
021	Pinal			
023	Santa Cruz			
027	Yuma			

Colorado Survey Units

1	Northern Front Range		4	Western
013	Boulder		007	Archuleta
019	Clear Creek		029	Delta
035	Douglas		033	Dolores
039	Elbert		045	Garfield
041	El Paso		067	La Plata
047	Gilpin		077	Mesa
059	Jefferson		081	Moffat
065	Lake		083	Montezuma
069	Larimer		085	Montrose
093	Park		091	Ouray
119	Teller		103	Rio Blanco
			113	San Miguel

2	Southern Front Range		5	Eastern
015	Chaffee		001	Adams
023	Costilla		005	Arapahoe
027	Custer		009	Baca
043	Fremont		011	Bent
055	Huerfano		017	Cheyenne
071	Las Animas		025	Crowley
101	Pueblo		031	Denver
			061	Kiowa
3	West Central		063	Kit Carson
003	Alamosa		073	Lincoln
021	Conejos		075	Logan
037	Eagle		087	Morgan
049	Grand		089	Otero
051	Gunnison		095	Phillips
053	Hinsdale		099	Prowers
057	Jackson		115	Sedgwick
079	Mineral		121	Washington
097	Pitkin		123	Weld
105	Rio Grande		125	Yuma
107	Routt			
109	Saguache			
111	San Juan			
117	Summit			

Idaho Survey Units

1	**Northern**		**3**	**Southwestern**
009	Benewah		005	Bannock
017	Bonner		007	Bear Lake
021	Boundary		011	Bingham
035	Clearwater		013	Blaine
049	Idaho		019	Bonneville
055	Kootenai		023	Butte
057	Latah		025	Camas
061	Lewis		029	Caribou
069	Nez Perce		031	Cassia
079	Shoshone		033	Clark
			037	Custer
2	**Southeastern**		041	Franklin
001	Ada		043	Fremont
003	Adams		047	Gooding
015	Boise		051	Jefferson
027	Canyon		053	Jerome
039	Elmore		059	Lemhi
045	Gem		063	Lincoln
073	Owyhee		065	Madison
075	Payette		067	Minidoka
085	Valley		071	Oneida
087	Washington		077	Power
			081	Teton
			083	Twin Falls

Montana Survey Units	1	Northwestern	4	West Central
	029	Flathead	007	Broadwater
	047	Lake	013	Cascade
	053	Lincoln	043	Jefferson
	089	Sanders	045	Judith Basin
			049	Lewis and Clark
	2	Eastern	059	Meagher
	003	Big Horn	077	Powell
	005	Blaine	107	Wheatland
	009	Carbon		
	011	Carter	5	Southwestern
	015	Chouteau	001	Beaverhead
	017	Custer	023	Deer Lodge
	019	Daniels	031	Gallatin
	021	Dawson	057	Madison
	025	Fallon	067	Park
	027	Fergus	093	Silver Bow
	033	Garfield		
	035	Glacier		
	037	Golden Valley		
	041	Hill		
	051	Liberty		
	055	McCone		
	065	Musselshell		
	069	Petroleum		
	071	Phillips		
	073	Pondera		
	075	Powder River		
	079	Prairie		
	083	Richland		
	085	Roosevelt		
	087	Rosebud		
	091	Sheridan		
	095	Stillwater		
	097	Sweet Grass		
	099	Teton		
	101	Toole		
	103	Treasure		
	105	Valley		
	109	Wibaux		
	111	Yellowstone		
	3	Western		
	039	Granite		
	061	Mineral		
	063	Missoula		
	081	Ravalli		

Nevada Survey Units

1 Nevada
- 001 Churchill
- 003 Clark
- 005 Douglas
- 007 Elko
- 009 Esmeralda
- 011 Eureka
- 013 Humboldt
- 015 Lander
- 017 Lincoln

1 Nevada (con.)
- 019 Lyon
- 021 Mineral
- 023 Nye
- 027 Pershing
- 029 Storey
- 031 Washoe
- 033 White Pine
- 510 Carson City

New Mexico Survey Units

1 Northwestern
- 001 Bernalillo
- 006 Cibola
- 028 Los Alamos
- 031 McKinley
- 039 Rio Arriba
- 043 Sandoval
- 045 San Juan
- 049 Santa Fe
- 055 Taos
- 061 Valencia

2 Northeastern
- 007 Colfax
- 019 Guadalupe
- 021 Harding
- 033 Mora
- 037 Quay
- 047 San Miguel
- 057 Torrance
- 059 Union

3 Southwestern
- 003 Catron
- 013 Dona Ana
- 017 Grant
- 023 Hidalgo
- 029 Luna
- 051 Sierra
- 053 Socorro

4 Southeastern
- 005 Chaves
- 009 Curry
- 011 De Baca
- 015 Eddy
- 025 Lea
- 027 Lincoln
- 035 Otero
- 041 Roosevelt

Utah Survey Units

1 Northern
- 003 Box Elder
- 005 Cache
- 011 Davis
- 029 Morgan
- 033 Rich
- 035 Salt Lake
- 043 Summit
- 045 Tooele
- 049 Utah
- 051 Wasatch
- 057 Weber

2 Uinta
- 009 Daggett
- 013 Duchesne
- 047 Uintah

3 Central
- 023 Juab
- 027 Millard
- 031 Piute
- 039 Sanpete
- 041 Sevier
- 055 Wayne

4 Eastern
- 007 Carbon
- 015 Emery
- 019 Grand
- 037 San Juan

5 Southwestern
- 001 Beaver
- 017 Garfield
- 021 Iron
- 025 Kane
- 053 Washington

Wyoming Survey Units

1	**Western**		**3**	**Northeastern**	
013	Fremont		005	Campbell	
017	Hot Springs		011	Crook	
023	Lincoln		045	Weston	
029	Park				
035	Sublette				
037	Sweetwater				
039	Teton				
041	Uinta				

2   **Central and Southeastern**

001	Albany
003	Big Horn
007	Carbon
009	Converse
015	Goshen
019	Johnson
021	Laramie
025	Natrona
027	Niobrara
031	Platte
033	Sheridan
043	Washakie

Pacific Northwest

California Survey Units

1	**North Coast**
015	Del Norte
023	Humboldt
045	Mendocino
097	Sonoma

2	**North Interior**
035	Lassen
049	Modoc
089	Shasta
093	Siskiyou
105	Trinity

3	**Sacramento**
007	Butte
011	Colusa
017	El Dorado
021	Glenn
033	Lake
055	Napa
057	Nevada
061	Placer
063	Plumas
067	Sacramento
091	Sierra
101	Sutter
103	Tehama
113	Yolo
115	Yuba

4	**Central Coast**
001	Alameda
013	Contra Costa
041	Marin
053	Monterey
069	San Benito
075	San Francisco
079	San Luis Obispo
081	San Mateo
083	Santa Barbara
085	Santa Clara
087	Santa Cruz
095	Solano
111	Ventura

5	**San Joaquin**
003	Alpine
005	Amador
009	Calaveras
019	Fresno
029	Kern
031	Kings
039	Madera
043	Mariposa
047	Merced
051	Mono
077	San Joaquin
099	Stanislaus
107	Tulare
109	Tuolumne

6	**Southern**
025	Imperial
027	Inyo
037	Los Angeles
059	Orange
065	Riverside
071	San Bernardino
073	San Diego

Oregon Survey Units

0	**Northwest**
05	Clackamas
07	Clatsop
09	Columbia
27	Hood River
47	Marion
51	Multnomah
53	Polk
57	Tillamook
67	Washington
71	Yamhill

1	**West Central**
03	Benton
39	Lane
41	Lincoln
43	Linn

2	**Southwest**
11	Coos
15	Curry
19	Douglas
29	Jackson
33	Josephine

3	**Central**
13	Crook
17	Deschutes
21	Gilliam
31	Jefferson
35	Klamath
37	Lake
55	Sherman
65	Wasco
69	Wheeler

4	**Blue Mountains**
01	Baker
23	Grant
25	Harney
45	Malheur
49	Morrow
59	Umatilla
61	Union
63	Wallowa

Washington Survey Units

	5	**Puget Sound**	**8**	**Central**	**9**	**Inland Empire**
	29	Island	01	Adams	07	Chelan
	33	King	03	Asotin	17	Douglas
	35	Kitsap	05	Benton	37	Kittitas
	53	Pierce	13	Columbia	39	Klickitat
	55	San Juan	19	Ferry	47	Okanogan
	57	Skagit	21	Franklin	77	Yakima
	61	Snohomish	23	Garfield		
	73	Whatcom	25	Grant		
			43	Lincoln		
	6	**Olympic Peninsula**	51	Pend Oreille		
	09	Clallam	63	Spokane		
	27	Grays Harbor	65	Stevens		
	31	Jefferson	71	Walla Walla		
	45	Mason	75	Whitman		
	67	Thurston				
	7	**Southwest**				
	11	Clark				
	15	Cowlitz				
	41	Lewis				
	49	Pacific				
	59	Skamania				
	69	Wahkiakum				

APPENDIX D—COUNTY CODES AND NAMES

Alaska Borough Codes

Code	County	Code	County
001	Juneau	017	Susitna-Kenai
003	Ketchikan	019	Tanana River
005	Petersburg	021	Copper River
007	Sitka	023	Upper Yukon
009	Yakutat	025	Lower Yukon
011	Afognak	027	Kuskokwim
013	Kenai	029	Bristol Bay
015	Cordova	031	Kotzebue
		033	Westward Alaska

Arizona County Codes

Code	County	Code	County
001	Apache	015	Mohave
003	Cochise	017	Navajo
005	Coconino	019	Pima
007	Gila	021	Pinal
009	Graham	023	Santa Cruz
011	Greenlee	025	Yavapai
012	La Paz	027	Yuma
013	Maricopa		

California County Codes

Code	County	Code	County
001	Alameda	059	Orange
003	Alpine	061	Placer
005	Amador	063	Plumas
007	Butte	065	Riverside
009	Calaveras	067	Sacramento
011	Colusa	069	San Benito
013	Contra Costa	071	San Bernardino
015	Del Norte	073	San Diego
017	El Dorado	075	San Francisco
019	Fresno	077	San Joaquin
021	Glenn	079	San Luis Obispo
023	Humboldt	081	San Mateo
025	Imperial	083	Santa Barbara
027	Inyo	085	Santa Clara
029	Kern	087	Santa Cruz
031	Kings	089	Shasta
033	Lake	091	Sierra
035	Lassen	093	Siskiyou
037	Los Angeles	095	Solano
039	Madera	097	Sonoma
041	Marin	099	Stanislaus
043	Mariposa	101	Sutter
045	Mendocino	103	Tehama
047	Merced	105	Trinity
049	Modoc	107	Tulare
051	Mono	109	Tuolumne
053	Monterey	111	Ventura
055	Napa	113	Yolo
057	Nevada	115	Yuba

Colorado County Codes

Code	County	Code	County
001	Adams	063	Kit Carson
003	Alamosa	065	Lake
005	Arapahoe	067	La Plata
007	Archuleta	069	Larimer
009	Baca	071	Las Animas
011	Bent	073	Lincoln
013	Boulder	075	Logan
015	Chaffee	077	Mesa
017	Cheyenne	079	Mineral
019	Clear Creek	081	Moffat
021	Conejos	083	Montezuma
023	Costilla	085	Montrose
025	Crowley	087	Morgan
027	Custer	089	Otero
029	Delta	091	Ouray
031	Denver	093	Park
033	Dolores	095	Phillips
035	Douglas	097	Pitkin
037	Eagle	099	Prowers
039	Elbert	101	Pueblo
041	El Paso	103	Rio Blanco
043	Fremont	105	Rio Grande
045	Garfield	107	Routt
047	Gilpin	109	Saguache
049	Grand	111	San Juan
051	Gunnison	113	San Miguel
053	Hinsdale	115	Sedgwick
055	Huerfano	117	Summit
057	Jackson	119	Teller
059	Jefferson	121	Washington
061	Kiowa	123	Weld
		125	Yuma

Hawaii County Codes

Code	County	Code	County
001	Hawaii (Hawaii Island)	007	Kauai (Kauai and Niihau Islands
003	Honolulu (Oahu Island)		
005	Kalawao	009	Maui (Kahoolawe, Lanai, Maui, and Molokai Islands)

Idaho County Codes

Code	County	Code	County
001	Ada	045	Gem
003	Adams	047	Gooding
005	Bannock	049	Idaho
007	Bear Lake	051	Jefferson
009	Benewah	053	Jerome
011	Bingham	055	Kootenai
013	Blaine	057	Latah
015	Boise	059	Lemhi
017	Bonner	061	Lewis
019	Bonneville	063	Lincoln
021	Boundary	065	Madison
023	Butte	067	Minidoka
025	Camas	069	Nez Perce
027	Canyon	071	Oneida
029	Caribou	073	Owyhee
031	Cassia	075	Payette
033	Clark	077	Power
035	Clearwater	079	Shoshone
037	Custer	081	Teton
039	Elmore	083	Twin Falls
041	Franklin	085	Valley
043	Fremont	087	Washington

Montana County Codes

Code	County	Code	County
001	Beaverhead	057	Madison
003	Big Horn	059	Meagher
005	Blaine	061	Mineral
007	Broadwater	063	Missoula
009	Carbon	065	Musselshell
011	Carter	067	Park
013	Cascade	069	Petroleum
015	Chouteau	071	Phillips
017	Custer	073	Pondera
019	Daniels	075	Powder River
021	Dawson	077	Powell
023	Deer Lodge	079	Prairie
025	Fallon	081	Ravalli
027	Fergus	083	Richland
029	Flathead	085	Roosevelt
031	Gallatin	087	Rosebud
033	Garfield	089	Sanders
035	Glacier	091	Sheridan
037	Golden Valley	093	Silver Bow
039	Granite	095	Stillwater
041	Hill	097	Sweet Grass
043	Jefferson	099	Teton
045	Judith Basin	101	Toole
047	Lake	103	Treasure
049	Lewis and Clark	105	Valley
051	Liberty	107	Wheatland
053	Lincoln	109	Wibaux
055	McCone	111	Yellowstone
		113	Yellowstone National Park

Nevada County Codes

Code	County	Code	County
001	Churchill	019	Lyon
003	Clark	021	Mineral
005	Douglas	023	Nye
007	Elko	027	Pershing
009	Esmeralda	029	Storey
011	Eureka	031	Washoe
013	Humboldt	033	White Pine
015	Lander	510	Carson City
017	Lincoln		

New Mexico County Codes

Code	County	Code	County
001	Bernalillo	029	Luna
003	Catron	031	McKinley
005	Chaves	033	Mora
006	Cibola	035	Otero
007	Colfax	037	Quay
009	Curry	039	Rio Arriba
011	De Baca	041	Roosevelt
013	Dona Ana	043	Sandoval
015	Eddy	045	San Juan
017	Grant	047	San Miguel
019	Guadalupe	049	Santa Fe
021	Harding	051	Sierra
023	Hidalgo	053	Socorro
025	Lea	055	Taos
027	Lincoln	057	Torrance
028	Los Alamos	059	Union
		061	Valencia

Oregon County Codes

Code	County	Code	County
001	Baker	037	Lake
003	Benton	039	Lane
005	Clackamas	041	Lincoln
007	Clatsop	043	Linn
009	Columbia	045	Malheur
011	Coos	047	Marion
013	Crook	049	Morrow
015	Curry	051	Multnomah
017	Deschutes	053	Polk
019	Douglas	055	Sherman
021	Gilliam	057	Tillamook
023	Grant	059	Umatilla
025	Harney	061	Union
027	Hood River	063	Wallowa
029	Jackson	065	Wasco
031	Jefferson	067	Washington
033	Josephine	069	Wheeler
035	Klamath	071	Yamhill

Utah County Codes

Code	County	Code	County
001	Beaver	029	Morgan
003	Box Elder	031	Piute
005	Cache	033	Rich
007	Carbon	035	Salt Lake
009	Daggett	037	San Juan
011	Davis	039	Sanpete
013	Duchesne	041	Sevier
015	Emery	043	Summit
017	Garfield	045	Tooele
019	Grand	047	Uintah
021	Iron	049	Utah
023	Juab	051	Wasatch
025	Kane	053	Washington
027	Millard	055	Wayne
		057	Weber

Washington County Codes

Code	County	Code	County
001	Adams	039	Klickitat
003	Asotin	041	Lewis
005	Benton	043	Lincoln
007	Chelan	045	Mason
009	Clallam	047	Okanogan
011	Clark	049	Pacific
013	Columbia	051	Pend Oreille
015	Cowlitz	053	Pierce
017	Douglas	055	San Juan
019	Ferry	057	Skagit
021	Franklin	059	Skamania
023	Garfield	061	Snohomish
025	Grant	063	Spokane
027	Grays Harbor	065	Stevens
029	Island	067	Thurston
031	Jefferson	069	Wahkiakum
033	King	071	Walla Walla
035	Kitsap	073	Whatcom
037	Kittitas	075	Whitman
		077	Yakima

Wyoming County Codes

Code	County	Code	County
001	Albany	023	Lincoln
003	Big Horn	025	Natrona
005	Campbell	027	Niobrara
007	Carbon	029	Park
009	Converse	031	Platte
011	Crook	033	Sheridan
013	Fremont	035	Sublette
015	Goshen	037	Sweetwater
017	Hot Springs	039	Teton
019	Johnson	041	Uinta
021	Laramie	043	Washakie
		045	Weston

APPENDIX E—FOREST TYPE CODES AND NAMES

Code	Forest type name
200	DOUGLAS-FIR TYPE GROUP
201	Douglas-fir
202	Douglas-fir - Western hemlock
203	Port Orford-cedar - Douglas-fir
210	PONDEROSA PINE TYPE GROUP
211	Ponderosa pine
212	Jeffrey pine
213	Ponderosa pine - sugar pine - fir
220	WESTERN WHITE PINE TYPE GROUP
221	Western white pine
230	FIR-SPRUCE TYPE GROUP
116	White spruce (in Alaska)
231	White fir and grand fir
232	Red fir
234	Pacific silver fir - hemlock
235	Engelmann spruce
236	Engelmann spruce - subalpine fir
240	HEMLOCK-SITKA SPRUCE TYPE GROUP
241	Western redcedar
242	Sitka spruce
247	Mountain hemlock - subalpine fir
248	Western hemlock
249	Alaska-cedar
250	LARCH TYPE GROUP
255	Larch - Douglas-fir
256	Grand fir - larch - Douglas-fir
257	Ponderosa pine - larch - Douglas-fir
260	LODGEPOLE PINE TYPE GROUP
261	Lodgepole pine
270	REDWOOD TYPE GROUP
271	Redwood
280	OTHER HARDWOODS TYPE GROUP
281	Red alder
282	Poplar - birch
283	Aspen
284	California black oak
285	Cottonwood - willow
286	Canyon live oak
287	Oak - Madrone
288	Other oaks
289	Ohia
192	Paper birch
290	OTHER FOREST TYPES (Arizona Cypress/Western Juniper)
112	Black Spruce (in Alaska)
291	Coulter pine
292	Digger pine - oak
294	Knobcone pine
295	Bristlecone pine
296	Whitebark pine
298	Limber pine
293	PINYON-JUNIPER
297	CHAPARRAL
299	NONSTOCKED

APPENDIX F—NATIONAL FOREST CODES AND NAMES

Region 1

102	BEAVERHEAD
103	BITTERROOT
104	IDAHO PANHANDLE
105	CLEARWATER
108	CUSTER
109	DEERLODGE
110	FLATHEAD
111	GALLATIN
112	HELENA
114	KOOTENAI
115	LEWIS and CLARK
116	LOLO
117	NEZ PERCE
120	CEDAR RIVER NGL (NATIONAL GRASSLAND)
121	LITTLE MISSOURI NGL
122	SHEYENNE NGL
124	GRAND RIVER NGL
199	OTHER NFS AREAS

Region 2

202	BIGHORN
203	BLACK HILLS
204	GRAND MESA-UNCOMPAHGRE-GUNNISON
206	MEDICINE BOW
207	NEBRASKA
209	RIO GRANDE
210	ARAPAHO-ROOSEVELT
211	ROUTT
212	PIKE and SAN ISABEL
213	SAN JUAN
214	SHOSHONE
215	WHITE RIVER
217	CIMARRON NGL
218	COMMANCHE NGL
219	PAWNEE NGL
220	OGLALA NGL
221	BUFFALO GAP NGL
222	FORT PIERRE NGL
223	THUNDER BASIN NGL
299	OTHER NFS AREAS

Region 3

301	APACHE-SITGREAVES
302	CARSON
303	CIBOLA
304	COCONINO
305	CORONADO
306	GILA
307	KAIBAB
308	LINCOLN
309	PRESCOTT
310	SANTA FE
312	TONTO
399	OTHER NFS AREAS

Region 4

401	ASHLEY
402	BOISE
403	BRIDGER-TETON
405	CARIBOU
406	CHALLIS
407	DIXIE
408	FISHLAKE
409	HUMBOLDT
410	MANTI-LASAL
412	PAYETTE
413	SALMON
414	SAWTOOTH
415	TARGHEE
417	TOIYABE
418	UINTA
419	WASATCH-CACHE
420	DESERT RANGE EXPERIMENT STATION
499	OTHER NFS AREAS

Region 5

501	ANGELES
502	CLEVELAND
503	ELDORADO
504	INYO
505	KLAMATH
506	LASSEN
507	LOS PADRES
508	MENDOCINO
509	MODOC
510	SIX RIVERS
511	PLUMAS
512	SAN BERNARDINO
513	SEQUOIA
514	SHASTA-TRINITY
515	SIERRA
516	STANISLAUS
517	TAHOE
519	LAKE TAHOE BASIN
599	OTHER NFS AREAS

Region 6	601	DESCHUTES
	602	FREMONT
	603	GIFFORD PINCHOT
	604	MALHEUR
	605	MT. BAKER-SNOQUALMIE
	606	MT. HOOD
	607	OCHOCO
	608	OKANOGAN
	609	OLYMPIC
	610	ROGUE RIVER
	611	SISKIYOU
	612	SIUSLAW
	614	UMATILLA
	615	UMPQUA
	616	WALLOWA-WHITMAN
	617	WENATCHEE
	618	WILLAMETTE
	620	WINEMA
	621	COLVILLE
	699	OTHER NFS AREAS
Region 10	002	TONGASS-STIKINE AREA
	003	TONGASS-CHATHAM AREA
	004	CHUGACH
	005	TONGASS-KETCHIKAN AREA
	099	OTHER NFS AREAS

APPENDIX G—SPECIES CODES AND NAMES

Numeric code	Alpha code[1]	Common name[1]	Scientific name[1]	Intermountain FIA point of diameter meas.
011	ABAM	Pacific silver fir	*Abies amabilis*	*[2]
014	ABBR	Bristlecone fir	*Abies bracteata*	*
015	ABCO	White fir	*Abies concolor*	d.b.h.
017	ABGR	Grand fir	*Abies grandis*	d.b.h.
018	ABLAA	Corkbark fir	*Abies lasiocarpa* var. *arizonica*	d.b.h.
019	ABLA	Subalpine fir	*Abies lasiocarpa*	d.b.h.
020	ABMA	California red fir	*Abies magnifica*	d.b.h.
021	ABSH	Shasta red fir	*Abies magnifica* var. *shastensis*	*
022	ABPR	Noble fir	*Abies procera*	*
041	CHLA	Port-Orford-cedar	*Chamaecyparis lawsoniana*	*
042	CHNO	Alaska-cedar	*Chamaecyparis nootkatensis*	*
050	CUPRE	Cypress	*Cupressus* spp.	d.b.h.
051	CUAR	Arizona cypress	*Cupressus arizonica*	d.b.h.
058	JUPI	Pinchot juniper	*Juniperus pinchotii*	d.r.c.
059	JUER	Redberry juniper	*Juniperus erythrocarpa*	d.r.c.
060	JUCO6	Common juniper	*Juniperus communis*	*
062	JUCA7	California juniper	*Juniperus californica*	d.r.c.
063	JUDE2	Alligator juniper	*Juniperus deppeana*	d.r.c.
064	JUOC	Western juniper	*Juniperus occidentalis*	d.r.c.
065	JUOS	Utah juniper	*Juniperus osteosperma*	d.r.c.
066	JUSC2	Rocky Mountain juniper	*Juniperus scopulorum*	d.r.c.
069	JUMO	Oneseed juniper	*Juniperus monosperma*	d.r.c.
072	LALY	Subalpine larch	*Larix lyallii*	d.b.h.
073	LAOC	Western larch	*Larix occidentalis*	d.b.h.
081	CADE27	Incense-cedar	*Calocedrus decurrens*	d.b.h.
092	PIBR	Brewer spruce	*Picea breweriana*	*
093	PIEN	Engelmann spruce	*Picea engelmannii*	d.b.h.
094	PIGL	White spruce	*Picea glauca*	d.b.h.
095	PIMA	Black spruce	*Picea mariana*	*
096	PIPU	Blue spruce	*Picea pungens*	d.b.h.
098	PISI	Sitka spruce	*Picea sitchensis*	*
101	PIAL	Whitebark pine	*Pinus albicaulis*	d.b.h.
102	PIAR	Bristlecone pine	*Pinus aristata*	d.b.h.
103	PIAT	Knobcone pine	*Pinus attenuata*	*
104	PIBA	Foxtail pine	*Pinus balfouriana*	*
106	PIED	Twoneedle pinyon	*Pinus edulis*	d.r.c.
108	PICO	Lodgepole pine	*Pinus contorta*	d.b.h.
109	PICO3	Coulter pine	*Pinus coulteri*	*
112	PIEN2	Apache pine	*Pinus engelmannii*	d.b.h.
113	PIFL2	Limber pine	*Pinus flexilis*	d.b.h.
114	PIST3	Southwestern white pine	*Pinus strobiformis*	d.b.h.
116	PIJE	Jeffrey pine	*Pinus jeffreyi*	d.b.h.
117	PILA	Sugar pine	*Pinus lambertiana*	d.b.h.
118	PILE	Chihuahuan pine	*Pinus leiophylla*	d.b.h.
119	PIMO3	Western white pine	*Pinus monticola*	d.b.h.
120	PIMU	Bishop pine	*Pinus muricata*	*
122	PIPO	Ponderosa pine	*Pinus ponderosa*	d.b.h.
124	PIRA2	Monterey pine	*Pinus radiata*	*
127	PISA2	California foothill pine	*Pinus sabiniana*	*
133	PIMO	Singleleaf pinyon	*Pinus monophylla*	d.r.c.
134	PIDI3	Border pinyon	*Pinus discolor*	d.r.c.

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[1]USDA, Natural Resources Conservation Service, 1994. The PLANTS data base. Ecological Sciences Division, Washington, DC.

[2]* indicates species not measured by Intermountain FIA.

Numeric code	Alpha code[1]	Common name[1]	Scientific name[1]	Intermountain FIA point of diameter meas.
135	PIAR5	Arizona pine	*Pinus arizonica*	d.b.h.
201	PSMA	Bigcone Douglas-fir	*Pseudotsuga macrocarpa*	*[2]
202	PSME	Douglas-fir	*Pseudotsuga menziesii*	d.b.h.
211	SESE3	Redwood	*Sequoia sempervirens*	*
212	SEGI2	Giant sequoia	*Sequoiadendron giganteum*	*
231	TABR2	Pacific yew	*Taxus brevifolia*	d.r.c.
242	THPL	Western redcedar	*Thuja plicata*	d.b.h.
251	TOCA	California nutmeg	*Torreya californica*	*
263	TSHE	Western hemlock	*Tsuga heterophylla*	d.b.h.
264	TSME	Mountain hemlock	*Tsuga mertensiana*	d.b.h.
300	ACACI	Acacia	*Acacia* spp.	d.r.c.
312	ACMA3	Bigleaf maple	*Acer macrophyllum*	*
313	ACNE2	Boxelder	*Acer negundo*	d.r.c.
321	ACGL	Rocky Mountain maple	*Acer glabrum*	d.r.c.
322	ACGR3	Bigtooth maple	*Acer grandidentatum*	d.r.c.
330	AECA	California buckeye	*Aesculus californica*	*
351	ALRU2	Red alder	*Alnus rubra*	*
352	ALRH2	White alder	*Alnus rhombifolia*	*
361	ARME	Pacific madrone	*Arbutus menziesii*	*
375	BEPA	Paper birch	*Betula papyrifera*	d.b.h.
376	BEPAC	Western paper birch	*Betula papyrifera* var. *commutata*	*
431	CACH6	Golden chinkapin	*Castanopsis chrysophylla*	*
475	CELE3	Curlleaf mountain-mahogany	*Cercocarpus ledifolius*	d.r.c.
476	CEMO2	True mountain-mahogany	*Cercocarpus montanus*	d.r.c.
477	CEMOP	Hairy mountain-mahogany	*Cercocarpus montanus* var. *paucidentatus*	d.r.c.
478	CEMOG	Birchleaf mountain-mahogany	*Cercocarpus montanus* var. *glaber*	d.r.c.
479	CEIN7	Littleleaf mountain-mahogany	*Cercocarpus intricatus*	d.r.c.
492	CONU4	Pacific dogwood	*Cornus nuttallii*	*
510	EUCAL	Eucalyptus	*Eucalyptus* spp.	*
542	FRLA	Oregon ash	*Fraxinus latifolia*	*
600	JUGLA	Walnut	*Juglans* spp.	*
631	LIDE3	Tanoak	*Lithocarpus densiflorus*	*
660	MALUS	Apple	*Malus* spp.	*
730	PLRA	California sycamore	*Platanus racemosa*	*
740	POPUL	Cottonwood and poplar	*Populus* spp.	d.b.h.
741	POBA2	Balsam poplar	*Populus balsamifera*	d.b.h.
742	PODE3	Eastern cottonwood	*Populus deltoides*	d.b.h.
745	PODEM	Plains cottonwood	*Populus deltoides* ssp. *monilifera*	d.b.h.
746	POTR5	Quaking aspen	*Populus tremuloides*	d.b.h.
747	POBAT	Black cottonwood	*Populus balsamifera* ssp. *trichocarpa*	d.b.h.
748	POFR2	Fremont cottonwood	*Populus fremontii*	d.b.h.
749	POAN3	Narrowleaf cottonwood	*Populus angustifolia*	d.b.h.
755	PROSO	Mesquite	*Prosopis* spp.	d.r.c.
760	PRUNU	Cherry	*Prunus* spp.	d.r.c.
764	PREM	Bitter cherry	*Prunus emarginata*	d.r.c.
800	QUERC	Oak—deciduous	*Quercus* spp.	d.r.c.
801	QUAG	California live oak	*Quercus agrifolia*	*
803	QUAR	Arizona white oak, Gray oak	*Quercus arizonica, grisea*	d.r.c.
805	QUCH2	Canyon live oak	*Quercus chrysolepis*	*
807	QUDO	Blue oak	*Quercus douglasii*	*
810	QUEM	Emory oak	*Quercus emoryi*	d.r.c.
811	QUEN	Engelmann oak	*Quercus engelmannii*	*

[1]USDA, Natural Resources Conservation Service, 1994. The PLANTS data base. Ecological Sciences Division, Washington, DC.
[2]* indicates species not measured by Intermountain FIA.

Numeric code	Alpha code[1]	Common name[1]	Scientific name[1]	Intermountain FIA point of diameter meas.
814	QUGA	Gambel oak	*Quercus gambelii*	d.r.c.
815	QUGA4	Oregon white oak	*Quercus garryana*	*[2]
818	QUKE	California black oak	*Quercus kelloggii*	*
821	QULO	California white oak	*Quercus lobata*	*
826	QUMU	Chinkapin oak	*Quercus muehlenbergii*	d.r.c.
829	QUOB	Mexican blue oak	*Quercus oblongifolia*	d.r.c.
839	QUWI2	Interior live oak	*Quercus wislizeni*	*
843	QUHY	Silverleaf oak	*Quercus hypoleucoides*	d.r.c.
850	QUE	Oak—evergreen	*Quercus* spp.	d.r.c.
902	RONE	New Mexico locust	*Robinia neomexicana*	d.r.c.
920	SALIX	Willow	*Salix* spp.	*
981	UMCA	California-laurel	*Umbellularia californica*	*
990	OLTE	Tesota (Arizona ironwood)	*Olneya tesota*	d.r.c.
999		Other trees (identify in remarks) or unknown.		

[1]USDA, Natural Resources Conservation Service, 1994. The PLANTS data base. Ecological Sciences Division, Washington, DC.

[2]* indicates species not measured by Intermountain FIA.

APPENDIX H—SPECIES GROUP CODES AND NAMES

Code	Species group name	Species included (numeric codes from appendix G)
1	Douglas-fir	202
2	Ponderosa & Jeffrey pine	116, 122, 135
3	True fir	11, 15, 17, 18, 19, 20
4	Western hemlock	263
5	Sugar pine	117
6	Western white pine	119
7	Redwood	211
8	Sitka spruce	98
9	Engelmann & other spruces	93, 94, 96
10	Western larch	73
11	Incense-cedar	81
12	Lodgepole pine	108
13	Other western softwoods	42, 71, 72, 101, 102, 104, 112, 113, 114, 118, 264
14	Western redcedar	242
15	Cottonwood & aspen	740, 741, 745, 746, 747, 748, 749
16	Red alder	351
17	Oak	807, 818, 821
18	Other western hardwoods	375
19	Woodland softwoods	51, 58, 59, 60, 62, 63, 64, 65, 66, 69, 95, 106, 133, 134, 231
20	Woodland hardwoods	300, 321, 322, 475, 476, 477, 478, 479, 755, 800, 803, 810, 814, 826, 843, 850, 902, 920, 990
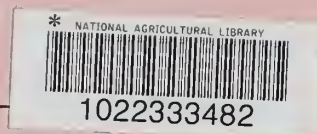
Describes the standard Westwide data base (WWDB) structure. This computer file
structure was developed to provide consistent data on the forest resources of the
Western United States. These data files are available to the public.

INTERMOUNTAIN RESEARCH STATION

The Intermountain Research Station provides scientific knowledge and technology to improve management, protection, and use of the forests and rangelands of the Intermountain West. Research is designed to meet the needs of National Forest managers, Federal and State agencies, industry, academic institutions, public and private organizations, and individuals. Results of research are made available through publications, symposia, workshops, training sessions, and personal contacts.

The Intermountain Research Station territory includes Montana, Idaho, Utah, Nevada, and western Wyoming. Eighty-five percent of the lands in the Station area, about 231 million acres, are classified as forest or rangeland. They include grasslands, deserts, shrublands, alpine areas, and forests. They provide fiber for forest industries, minerals and fossil fuels for energy and industrial development, water for domestic and industrial consumption, forage for livestock and wildlife, and recreation opportunities for millions of visitors.

Several Station units conduct research in additional western States, or have missions that are national or international in scope.

Station laboratories are located in:

Boise, Idaho

Bozeman, Montana (in cooperation with Montana State University)

Logan, Utah (in cooperation with Utah State University)

Missoula, Montana (in cooperation with the University of Montana)

Moscow, Idaho (in cooperation with the University of Idaho)

Ogden, Utah

Provo, Utah (in cooperation with Brigham Young University)

Reno, Nevada (in cooperation with the University of Nevada)